

CLAIMS

1. An information recording apparatus which irradiates a laser light on a recording medium and forms recording marks according to a recording signal, comprising:

a driving source which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a light source which emits the laser light;

a signal generating unit which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end portion and having the first magnitude, and an intermediate bias portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

a control unit which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the signal generating unit shifts a position of the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

2. The information recording apparatus according to claim 1, wherein a shift quantity of the top pulse is a value between $0.1T$ and $2.0T$.

3. The information recording apparatus according to claim 1, wherein the signal generating unit sets the first magnitude to a value between 1.1 times and 2.0 times of the second magnitude, when the recording medium is rotationally driven at the second rotation speed.

4. An information recording apparatus which irradiates a laser light on a recording medium and forms recording marks according to a recording signal, comprising:

5 a driving source which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a light source which emits the laser light;

10 a signal generating unit which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end portion and having the first magnitude, and an intermediate bias portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

15 a control unit which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

20 wherein the signal generating unit shifts a position of the last pulse behind a position of the last pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

25 5. The information recording apparatus according to claim 4, wherein a shift quantity of the last pulse is a value between 0.1T and 2.0T.

30 6. The information recording apparatus according to claim 4, wherein the signal generating unit sets the first magnitude to a value between 1.1 times and 2.0 times of the second magnitude, when the recording medium is rotationally driven at the second rotation speed.

7. An information recording apparatus which irradiates a laser light on a recording medium and forms recording marks

according to a recording signal, comprising:

a driving source which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

5 a light source which emits the laser light;

a signal generating unit which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, and a pulse train portion having one or a plurality of pulse following the top pulse, based on the
10 recording signal; and

a control unit which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the signal generating unit shifts a position of
15 the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

20 8. The information recording apparatus according to claim 7, wherein a shift quantity of the top pulse is a value between 0.1T and 1.5T.

9. The information recording apparatus according to claim
25 7, wherein the signal generating unit sets a duty ratio of the pulse train portion to a value between 0.3 and 0.9, when the recording medium is rotationally driven at the second rotation speed.

10. An information recording method which irradiates a
30 laser light from a light source on a recording medium and forms recording marks according to a recording signal, comprising:

a driving process which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a signal generating process which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end portion and having the first magnitude, and an intermediate bias
5 portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

a control process which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

10 wherein the signal generating process shifts a position of the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

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11. An information recording method which irradiates a laser light from a light source on a recording medium and forms recording marks according to a recording signal, comprising:

a driving process which rotationally drives the recording
20 medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a signal generating process which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end
25 portion and having the first magnitude, and an intermediate bias portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

a control process which irradiates a laser pulse on the recording medium by controlling the light source based on the
30 recording pulse signal,

wherein the signal generating process shifts a position of the last pulse behind a position of the last pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven

at the second rotation speed.

12. An information recording method which irradiates a laser light from a light source on a recording medium and forms
5 recording marks according to a recording signal, comprising:

a driving process which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

10 a signal generating process which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude and, and a pulse train portion having one or a plurality of pulse following the top pulse, based on the recording signal; and

15 a control process which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

20 wherein the signal generating process shifts a position of the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.